

Patent claims

PCT Amended Sheets

1. An optical coupling device for coupling light between two optical waveguide end faces, said device comprising:
  - two optical waveguides having end faces,
  - a variable-length element which carries one of the two optical waveguides via a holding element and is fixed to the other optical waveguide by at least one holding block;
  - a variable-length compensating element which is connected to the variable-length element, and is fixed to a second holding block;
  - wherein the length of the variable-length compensating element changes with temperature by the same amount, but in the opposite sense, as that of the variable-length element; and
  - wherein the geometric position of one optical waveguide end face is capable of being varied with respect to the other optical waveguide end face by movement of the variable-length element.
2. The coupling device according to Claim 1, wherein the length of the variable-length compensating element is selected, taking its coefficient of expansion into account, such that the length of the variable-length compensating element changes by the same amount but in the opposite sense as that of the variable-length element.
3. The optical coupling device according to Claim 1, wherein the variable-length element is made of aluminium.
4. The optical coupling device according to Claim 2, wherein the variable-length element is made of aluminium.
5. The coupling device according to Claim 1, wherein the material of the variable-length compensating element is a glass ceramic.
6. The coupling device according to Claim 2, wherein the material of the variable-length compensating element is a glass ceramic.

7. The coupling device according to Claim 3, wherein the material of the variable-length compensating element is a glass ceramic.
8. The coupling device according to Claim 4, wherein the material of the variable-length compensating element is a glass ceramic.
9. The optical coupling device for injecting light between two optical waveguide end faces, the geometric position of one optical waveguide end face, for example of an optical fibre, being capable of being varied with respect to the other optical waveguide end face, for example of an optical waveguide chip, with the aid of a variable-length element, said coupling device comprising:

a variable-length element which carries one of the two optical waveguides via a holding element and is fixed to the other optical waveguide by means of at least one holding block, wherein the holding block has a U-shaped part made of a material with the same coefficient of thermal expansion as the other optical waveguide, and further in that a T-shaped part made of a material with the same coefficient of thermal expansion as the other optical waveguide is provided, wherein further that the variable-length element with the positive coefficient of thermal expansion is connected to the T-shaped part at its foot and to the U-shaped part at its base, and wherein further in that two variable-length elements with a positive coefficient of thermal expansion are fixed to the legs of the U-shaped part, which consist of the same material as the variable-length element and have the same length as the latter and which, on one side, are fixed to the legs of the U-shaped part and, on the other side, to the underside of the crossbar of the T-shaped part.
10. The coupling device according to Claim 9, wherein the variable-length elements consist of aluminium.
11. The coupling device according to Claim 5, wherein the material of the U-shaped part and of the T-shaped part is a glass ceramic with the same coefficient of thermal expansion as the other optical waveguide.
12. The coupling device according to Claim 11, wherein the material of the U-shaped part

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and the material of the T-shaped part is the same as the other optical waveguide.